

Honeywell Docket No. H0002233.33717 US - 4018
Buchalter Docket No.: H9925-2905

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: **Paul Silinger**

Serial No: **10/765782**

Filed: **June 11, 2003**

For: **INTERNAL HEAT SPREADER
PLATING METHODS AND
DEVICES**

Examiner: **Luan V. Van**

Art Unit: **1795**

**RESPONSE UNDER
37 C.F.R. section 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP
1795**

RESPONSE AFTER FINAL OFFICE ACTION

MAIL STOP AF
COMMISSIONER OF PATENTS
P.O. Box 1450
ALEXANDRIA, VA 22313-1450

Dear Sir:

This paper responds to the Final Office Action dated December 29, 2008.
Please review the following:

CLAIMS AMENDMENTS: None, but shown on page 2 for Examiner's Reference

SPECIFICATION AMENDMENTS: None

FIGURES AMENDMENTS: None

REMARKS SECTION: Begins on Page 5

IN THE CLAIMS

1. (Previously Presented) A plating system comprising:
 - an elongated upper channel formed by two upper shields and an elongated lower channel formed by two lower shields, wherein each channel is separated by a gap between the upper and lower shields; and
 - a plating solution horizontal sparger comprising a series of inlets oriented to direct any plating solution flowing through the inlets directly into one and towards another of the upper and lower channels.
2. (Original) The system of claim 1 further comprising:
 - an anode; and
 - a substantially planar cathode comprising a first surface conductive surface, a second conductive surface, and a perimeter edge, the first conductive surface and second conductive surfaces being substantially parallel to each other and positioned on opposite sides of the cathode; wherein the sparger is positioned at least as close to the perimeter edge of the cathode as to either of the first or second conducting surfaces.
3. (Original) The system of claim 2 wherein the sparger directs any plating solution flowing through the inlets towards the cathode in a plane substantially coplanar with the cathode.
4. (Original) The system of claim 3 wherein:
 - each of the upper and lower channels comprises two substantially planar and parallel non electrically conductive sides that are substantially parallel to the cathode; and
 - the cathode is positioned at least partially within each of the upper and lower channels between the non electrically conductive sides.
5. (Original) The system of claim 4 wherein:
 - the upper and lower channels are positioned opposite each other and are separated from each other, the separation between the channels forming

a pair of solution egress slots; and
the channels are adapted to prevent current from flow between the anode and cathode other than through the egress slots.

6. (Original) The system of claim 5 wherein the egress slots are positioned approximately parallel to a center line of the cathode.
7. (Original) The system of claim 6 wherein the cathode comprises a dielectric substrate and the conductive surfaces are adapted to promote the formation of heat spreaders on the dielectric substrate.
8. (Original) The system of claim 1 wherein each of the upper channel and lower channel have a width less than or equal to one inch.
9. (Previously Presented) The system of claim 1 wherein the horizontal sparger directs any plating solution flowing through the inlets into the lower channel and towards the upper channel.
10. (Original) The system of claim 1 wherein each of the upper channel and lower channel have a width less than or equal to 0.5 inches.
11. (Original) The system of claim 1 wherein each of the upper channel and lower channel have a width less than or equal to 0.5 inches. and the further comprising a plurality of part holding clamps electrically coupled to a power source and positioned within the upper channel or the lower channel.
12. (Original) The system of claim 1 further comprising a plurality of anodes positioned outside and along the length of the upper and lower channels.
13. (Original) The system of claim 1 wherein the upper channel and lower channel are separated by a distance and at least one of the upper channel and lower channel are adapted to be moved to vary the distance.

14. (Original) The system of claim 1 wherein the shortest distance from a part being plated to a channel wall is less than the shortest distance between the channel wall and an anode.

Claims 15-18: Canceled.

REMARKS

35 USC §103

Claims 1-14 are rejected under 35 USC §103(a), as being unpatentable over The Admitted Prior Art (Figure 1 of the Applicant's specification) in view of Akino et al. (JP Publication 08-296086).

Claims 1-14 are rejected under 35 USC §103(a), as being unpatentable over Akino et al. in view of The Admitted Prior Art.

The Applicant respectfully disagrees with both rejections.

Amended Claim 1 recites:

"A plating system comprising:

- an elongated upper channel formed by two upper shields and an elongated lower channel formed by two lower shields, wherein each channel is separated by a gap between the upper and lower shields; and
- a plating solution horizontal sparger comprising a series of inlets oriented to direct any plating solution flowing through the inlets directly into one and towards another of the upper and lower channels."

The Examiner appears again to be overbroadening the Akino reference and how it may or may not apply to the present claims. As a review, claim 1 recites a "plating solution horizontal sparger comprising a series of inlets oriented to direct any plating solution flowing through the inlets". The Examiner – from the comments in the Final Office Action – appears to disregard the fact that the Applicant isn't referring to any solution flowing through the inlets, but is reciting any **plating** solution. Patents are allowed for new applications of old technology, and the Akino reference can be viewed

as old technology. Akino uses air or fluid flow to render the plating solution turbulent. The plating solution is already in the tank. The current application uses plating solution spargers to direct plating solution into the tank. There is absolutely nothing in the Akino reference that would trigger to one of ordinary skill in the art that the Akino turbulence nozzle would or should be used to introduce plating solution. There still needs to be a motivation present in the reference to show one of ordinary skill in the art that the new feature of introducing plating solution through the nozzle is even necessary after reading the Akino reference – which it absolutely isn't, since the function of the Akino nozzle is to merely agitate the solution already present. The Applicant respectfully requests that the Examiner review this case with a Supervisor and contact the undersigned Attorney of Record immediately for a teleconference/interview to move this case to allowance.

The Applicants reiterate the argument presented in the response to the January 29, 2008 Office Action:

As pointed out in the Specification, an improved plating system 100 is shown in **Figure 2** which provides for improved metal distribution over a work piece 900. In the improved system 100, the vertical spargers (spargers 11 in **Figure 1**) found in prior art plating systems are eliminated and fluid 800 enters the chamber 120 through the bottom of the chamber with the bottom of the chamber acting as a horizontal sparger 110. By eliminating the vertical spargers, the distance D2 between the part being plated 900 and the shields 130 can be decreased (with a corresponding decrease in the distance D4 between the fields forming the sides of the channel).

As the Specification also specifically points out, the system of **Figure 2** may be obtained by modifying the system of **Figure 1** (a Technic Inc. MP 300 — and Applicant's Admitted Prior Art) in the following manner: (1) eliminating the tubular vertical solution spargers and replacing them with holes 111 fabricated in the lower plenum so that solution travels around the parts to be plated as a turbulent flow from the bottom of the parts to the tops, and not from the sides; (2) increasing the solution velocity; (3) moving

the shields closer to the parts to be plated (cathodes); (4) incorporating part holding clamps sufficiently narrow so as to adequately hold the part while still permitting the claims and parts to move between the shields; and (5) incorporating a double rinsing and drying process where the plating/part holding fixture is rinsed and dried first, and the plated part and lower half of the fixture are subsequently rinsed and dried. These modifications to the Technic system render the claims of the current application patentable as not anticipated by Technic, because Technic cannot possibly anticipate the modifications disclosed in the current system and recited in the claims.

The Examiner then cites the Akino reference and takes a rather large leap as to what Akino is stating. The Examiner says:

"Since the plating electrolyte is introduced by the hydraulic nozzle of Akino et al. directly into the lower channel, the plating electrolyte is displaced from the lower channel to the upper channel as the plating electrolyte is continuously introduced into the plating tank."

Actually, the Applicants – after a fair reading of Akino – cannot find that characterization of the hydraulic nozzle, and in fact contend that Akino is using the nozzle for a completely different purpose – to introduce air into the chamber, which will introduce turbulence into the fluid already in the chamber. Specifically, Akino states:

"Further, in the vicinity of the current shielding plates 5 at both sides of the lower portion, a fluid nozzle 7 for fluidizing a plating solution 6 **by ejecting a fluid such as air** from between them is provided." (emphasis added)

And then Akino states:

"...the plating solution 6 in the vicinity of the metallic strip 3 is sufficiently agitated with the fluid nozzle 7, whereby the primary current distribution is uniformized, and the uniformization of the plating thickness distribution is achieved."

Note that the Akino reference does not state that the fluid nozzle 7 discharges the plating solution 6. This lack of disclosure is significant, because if the inventors in the Akino reference had intended to discharge plating solution, they would have stated so in the description of Figure 7. Instead, they refer to the fluid coming out of fluid nozzle 7 as "agitating" the plating solution 6, as shown in the second paragraph of the translated portions in your last letter. Claim 1 clearly recites that the inlets direct plating solution flowing through the inlets into the channels. That fact just isn't stated in the Akino reference.

The Applicant believes, after reviewing the Examiner's Answer, that the Examiner is merely assembling puzzle pieces to arrive at a whole "prior art reference", and the Examiner is also improperly deconstructing claim 1 of the present application to arrive at the goal the Examiner wishes to reach.

Therefore, Applicant's Admitted Prior Art, alone or in combination with Akino, cannot render unpatentable claim 1 of the present application, because one of ordinary skill in the art cannot possibly review the Admitted Prior Art or Akino on its face and, remove the vertical spargers, place horizontal spargers in the bottom of the chamber, direct any plating solution flowing through the inlets directly into one and towards another of the upper and lower channels and arrive at claim 1.

REQUEST FOR TELECONFERENCE WITH EXAMINER AND EXAMINER'S SUPERVISOR

The Applicants respectfully request an interview as soon as possible to discuss this case with the Examiner and the Examiner's supervisor, if this case is not in condition for allowance. This case has been pending for a considerable amount of time, and the undersigned attorney-of-record would like to resolve this case as soon as possible. Dr. Thompson can generally be reached any time Monday through Friday from 8AM to 3PM PST at 949-224-6282.

REQUEST FOR ALLOWANCE

Claims 1-14 are pending in this application, and the Applicant respectfully requests that the Examiner reconsider all of the claims in light of the arguments presented and allow all current and pending claims.

Respectfully submitted,

Buchalter Nemer

Dated: December 29, 2008

By:


Sandra P. Thompson

Reg. No. 46264

Attorneys for Applicant(s)

Buchalter Nemer

18400 Von Karman Ave. Suite 800

Irvine, CA 92612

949-224-6282

949-224-6203 (fax)